REMARKS

The foregoing amendment amends independent claims 1, 15, 48 and 49. Pending in the application are claims 1-22, 24-41, 48 and 49, of which claims 1, 15, 48 and 49 are independent. The following comments address all stated grounds for rejection and place the presently pending claims, as identified above, in condition for allowance.

Independent claims 1, 15, 48 and 49 are amended to positively recite a liquid in the microchannel, and to specify that none of the fluid enters the fluid interface port. The amendments also change the phrase, "with a constant depth extending from an outer surface of the cover to an inner surface of the cover", which the Examiner considers to not be taught in the specification to ---with a depth extending through the cover---, as shown in Figures 2A and 2B, at least. Support for the amendment can be found throughout the application as originally filed, at least, for example in Figures 4A, 8, and described on page 21, lines 20-23. *No new matter is added.*

Amendment and/or cancellation of the claims is not to be construed as an acquiescence to any of the objections/rejections set forth in the instant Office Action, and was done solely to expedite prosecution of the application. Applicant reserves the right to pursue the claims as originally filed, or similar claims, in this or one or more subsequent patent applications.

Double Patenting Rejection

Claims 1-22 and 24-41 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-28 and 58-150 of copending Application No. 10/028,852 as characterized by US 2003/0007898 and claims 1-45 copending Application No. 10/057,354. Applicants submit that the claims are patentably distinct from the claims of co-pending U.S. Patent Application Nos. 10/028,852 and 10/057,354. If necessary, Applicants will file a Terminal Disclaimer upon resolution of all other outstanding issues.

In addition, the Examiner rejects claims 1-22 and 24-41 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-26 of U.S. Patent

Number 6,877,528. The claims in the present application are entirely different from the claims in U.S. Patent Number 6,877,528. For example, the claims in the present invention are directed to a fluid interface port for interfacing fluid between an interior and an exterior of a channel. In contrast, the claims of the '528 patent are directed to a valve for a microfluidic device for regulating fluid flow therein. The meniscus in the '528 claims interfaces a side channel with a reservoir, not an exterior environment, that is used to create a pressure pulse. In contrast, the meniscus in the present application is formed within and co-planar with a side wall of a channel, such that the meniscus is flush with the side wall. In addition, the meniscus in the claims of the '528 patent is not necessarily a virtual wall and used only to transfer a pressure pulse to a flow channel in order to regulate flow therein. The meniscii in the two sets of claims have different configurations and purposes. In addition, both the claims of the '528 patent recite different features, such as a gas-filled first reservoir, a buffer reservoir, actuators, side channels not present in the claims of the present invention.

Claim Rejections Under 35 USC §112

Regarding the rejection of claims 1-22 and 24-41 under 35 USC §112, Applicants submit that the cited recitations are fully supported in the specification, and clearly shown in the Figures. To expedite prosecution, Applicants have removed the recitation in independent claims 1, 15, 48 and 49 that the fluid interface port has a constant depth extending from an outer surface of the cover to an inner surface of the cover, though Applicants maintain that such recitation is clearly supported in the specification as originally filed.

Regarding the recitation that the diameter of the port is less than the diameter of the microchannel, Applicants submit that this recitation is fully and adequately supported in the specification. For example, on page 5, lines 4-6, the specification states that "the lateral dimensions of the fluid interface port 17 are substantially identical to *or less than the diameter of the microchannel* 3" (emphasis added). Figures 2A, 5A, 10A and 10B also illustrate this relationship of a port diameter that is smaller than an associated microchannel diameter.

For at least these reasons, Applicant request reconsideration and withdrawal of the 35 U.S.C. §112 Rejection.

Claim Rejections Under 35 USC §102

In the Office Action, the Examiner maintains and finalizes the rejection of claims 1-22 and 24-41 under 35 U.S.C. 102(e) as being anticipated by the Chow reference (U.S. Patent Number 6,494,230), claims 1-22 and 24-41 under 35 U.S.C. 102(b) as being anticipated by the Handique reference (U.S. Patent Number 6,130,098), and claims 1-22 and 24-41 under 35 U.S.C. 102(b) as being anticipated by the Fuchs reference (U.S. Patent Number 5,757,482). Applicants submit that the pending claims distinguish patentably over the cited references, and request reconsideration and allowance of the pending claims.

Independent claims 1, 15, 48 and 49 specify that none of the liquid in a microchannel enters into the fluid interface port, a feature not disclosed in the cited references.

In addition, Applicants maintain that the cited references, alone or in combination, do not disclose a device having a fluid interface port with a constant depth that is substantially smaller than the diameter of the fluid interface port, as recited in independent claims 1 and 15. The recited fluid interface ports thus have a *disk* shape, as shown in Figures 2A and 2B, and described on page 17, lines 19-20, to facilitate *direct* access to the channel interior, a feature not taught or suggested in the cited references.

In contrast to the claimed invention, the Chow reference includes ports 126, 128, 130, 132, that are extremely large relative to the associated channels 124. The ports 126 and 128 in Chow are clearly larger in diameter than the associated microchannel, in contrast to the claimed invention. These ports will naturally fill at least partially with liquid when added to the system. In fact, the Chow reference requires that the fluid introduction ports 126, 128, 130 and 132 be relatively large. For example, Chow specifies that "the ports described above will generally range from about 0.5 mm to about 10 mm, and preferably from about 1 mm to about 5 mm, the fluid passages disposed through the substrates on the other hand, will typically range from about 30 um to about 500 um in diameter" (see column 10, lines 40-47). In addition, Chow specifies that the "type of port structure is described in substantial detail in commonly owned U.S. Pat. No. 6,090,251" which illustrates ports 34 that are substantially filled with liquid 50, with the liquid held in the port 34 by capillary force, in clear contrast to the claimed invention. (See

Figure 3 of U.S. Patent Number 6,090,251 below) Therefore, Chow not only fails to anticipate the claimed invention, Chow in fact teaches *away* from the claimed invention.

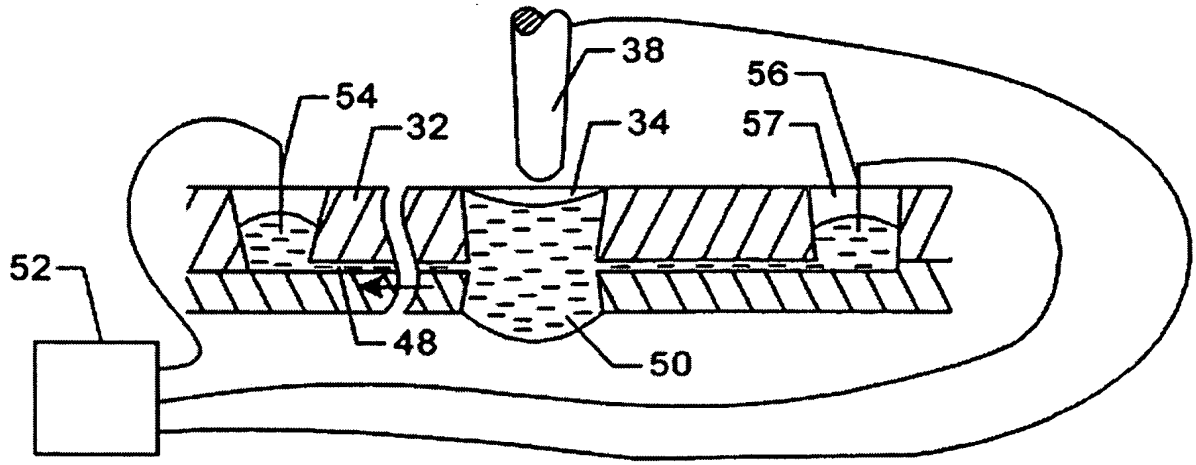


Fig. 3

Regarding the rejection in view of the Handique reference, the Handique reference clearly illustrates liquid filling the ports 20 and 30, in contrast with the claimed invention. In addition, the entry port (A) in Handique has a cross-section diameter greater than the diameter of the channel, in contract to the claimed invention. The vent 70 in Handique also forms a channel having a depth that is significantly *larger* than the cross-section of the channel, in contrast to the claimed invention. The vent 70 is also incapable of positioning a meniscus in a co-planar location with a side wall. Rather, any meniscus formed in the vent 70 of Handique will align only with a small portion of a side wall, in contrast to the claimed invention. In addition, the vent 70 clearly affects the flow of fluid in the associated channel, which teaches away from the claimed virtual wall, which does not at all affect the flow of fluid and merely replaces a removed portion of the side wall.

Regarding the rejection in view of the Fuchs reference, the cross-sectional diameter of the port 24 in Fuchs, which is significantly *larger* than the channels 12 and 16 in contrast to the claimed invention, would cause liquid in an associated channel 12 and 16 to fill the port 24 as well, also in contrast to the claimed invention. In addition, the Fuchs reference discloses that the port 24 is formed in the cover 12, which is at least 400 microns thick, as set forth in column 5, lines 12-14. Therefore, even *if* the depth of the port 24 *was* significantly smaller than the diameter of the port, the port diameter would be required to be several times the recited range of between about 25 μm and about 100 μm.

For at least these reasons, and for the reasons submitted in previous responses, Applicants respectfully submit that all pending examined claims are patentable, and request that the objections and rejections be reconsidered and withdrawn.

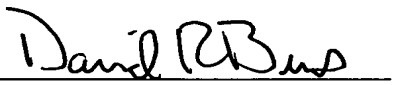
CONCLUSION

In view of the above amendment, applicants believe the pending application is in condition for allowance.

If any fee is due, please charge our Deposit Account No. 12-0080, under Order No. TGZ-001C from which the undersigned is authorized to draw.

Dated: October 31, 2007

Respectfully submitted,

By 

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